#3/Pre-Amdt A
3-22-02
Dade

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Mirmajid Seyyedy

Serial No.: 09/911,116

Filed: July 23, 2001

For: FLIP CHIP TECHNIQUE FOR CHIP ASSEMBLY

Examiner: Unknown

Group Art Unit: 2814

Attorney Docket No.: 2777.4US (95-1024.2)

CERTIFICATE OF MAILING

I hereby certify that this correspondence along with any attachments referred to or identified as being attached or enclosed is being deposited with the United States Postal Service as First Class Mail (under 37 C.F.R. § 1.8(a)) on the date of deposit shown below with sufficient postage and in an envelope addressed to the Commissioner for Patents, Washington, D.C. 20231.

February 12, 2002
Date of Deposit

Signature of registered practitioner or other person having reasonable basis to expect mailing to occur on date of deposit shown pursuant to 37 C.F.R. § 1.8(a)(1)(ii)

Deidra Pfeil
Typed/printed name of person whose signature is contained above

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Please revise the above-identified application as follows:

IN THE CLAIMS:

Claims are presented below in format for publication. Claims 1-20 have been amended. Please enter these claims as amended. Attached is Appendix A, which contains a marked-up version of the claims as revised.

1. (Amended) An assembly comprising:

a first semiconductor die having at least one lead on an active surface thereof, said at least one lead having at least one conductive pad disposed thereon, said at least one conductive pad having an upper surface, having a thickness and extending above said active surface of said first semiconductor die said thickness of said at least one conductive pad, said first semiconductor die substrate having a passivation layer disposed on said active surface thereof having a thickness greater than said thickness of said at least one conductive pad, said passivation layer having at least one via therein, said at least one conductive pad extending into and through only a portion of said at least one via, and said first semiconductor die having a layer of adhesive covering at least a portion of said passivation layer on said active surface, said layer of adhesive having a thickness; and

A1 cont

a second substrate die having at least one lead on a facing surface thereof, said at least one lead of said second substrate die having at least one conductive pad disposed thereon, said at least one conductive pad of said second substrate die having an upper surface, having a thickness and extending above said facing surface of said second substrate die, said thickness of said at least one conductive pad of said second substrate die being at least a combined thickness of said layer of adhesive covering at least a portion of said passivation layer on said active surface of said first semiconductor die and a remaining portion of said at least one via having said at least one conductive pad of said first semiconductor die extending thereinto;

wherein said second substrate die being attached to said first semiconductor die by said adhesive layer of said first semiconductor die, said first semiconductor die having said upper surface of said at least one conductive pad on said at least one lead substantially forming movable, electrical contact without mechanical attachment with said upper surface of said at least one conductive pad on said at least one lead of said second substrate die, said movable electrical contact provided when said second substrate die is permanently attached to said first semiconductor die by said layer of adhesive.

2. (Amended) The assembly of claim 1, wherein at least one of said active surface of said first semiconductor die and said facing surface of said second substrate die includes at least one groove thereon.

3. (Amended) The assembly of claim 1, wherein at least one of said first semiconductor die and said second substrate die comprises a flip chip.

4. (Amended) The assembly of claim 1, wherein at least one of said first semiconductor die and said second substrate die comprises a silicon wafer.

5. (Amended) An assembly comprising:

a first semiconductor die having at least one lead on an active surface thereof, said at least one lead having at least one conductive pad disposed thereon, said at least one conductive pad having an upper surface, having a thickness and extending above said active surface of said first semiconductor die said thickness of said at least one conductive pad, said first substrate having a passivation layer disposed on said active surface thereof having a thickness greater than said thickness of said at least one conductive pad, said passivation layer having at least one via therein, said at least one conductive pad extending into and through only a portion of said at least one via; and

a first substrate having at least one lead on a facing surface thereof, said at least one lead of said first substrate having at least one conductive pad disposed thereon, said at least one conductive pad of said first substrate having an upper surface, having a thickness and extending above said facing surface of said second substrate, said thickness of said at least one conductive pad of said first substrate being at least a thickness of a remaining portion of said at least one via having said at least one conductive pad of said first semiconductor die extending thereinto, said first semiconductor die being attached to said second substrate by an encapsulation material substantially surrounding said first semiconductor and a portion of said second substrate, said first substrate having said

upper surface of said at least one conductive pad on said at least one lead of said first semiconductor die substantially forming movable, electrical contact without mechanical attachment with said upper surface of said at least one conductive pad on said at least one lead of said first substrate.

6. (Amended) An assembly comprising:

a first semiconductor device having at least one lead on a first side thereof, said at least one lead having at least one conductive pad disposed thereon having a substantially flat surface thereon, having a thickness and extending above said first side of said first semiconductor die said thickness of said at least one conductive pad, said first semiconductor device having a passivation layer disposed on said first side thereof having a thickness greater than said thickness of said at least one conductive pad, said passivation layer having at least one via therein, said at least one conductive pad extending into and through only a portion of said at least one via, and said first semiconductor device having a layer of adhesive covering at least a portion of said passivation layer on said first side, said layer of adhesive having a thickness; and

A1 cont

a first semiconductor die having at least one lead on a first side thereof, said at least one lead of said first substrate having at least one conductive pad disposed thereon, said at least one conductive pad of said first substrate having a substantially flat surface thereon, having a thickness and extending above said first side of said first substrate, said thickness of said at least one conductive pad of said first substrate being at least a combined thickness of said layer of adhesive covering said at least a portion of said passivation layer on said first side of said first semiconductor device and a remaining portion of said at least one via having said at least one conductive pad of said first semiconductor device extending thereinto, said first substrate being juxtaposed to said first semiconductor die by said layer of adhesive, said first semiconductor device having said substantially flat surface of said at least one conductive pad on said at least one lead of said first semiconductor device forming movable, electrical contact without mechanical attachment with said

substantially flat surface of said at least one conductive pad on said at least one lead of said first substrate, said movable, electrical contact provided when said first substrate is permanently juxtaposed to said first semiconductor device by said layer of adhesive.

7. (Amended) A semiconductor assembly comprising:

a first substrate having at least one lead on a facing surface thereof, said at least one lead having at least one conductive pad disposed thereon, said at least one conductive pad having an upper surface, having a thickness and extending above said facing surface of said first substrate said thickness of said at least one conductive pad, said first substrate having a passivation layer disposed on said facing surface thereof having a thickness greater than said thickness of said at least one conductive pad, said passivation layer having at least one via therein, said at least one conductive pad extending into and through only a portion of said at least one via; and

Plcont

a second substrate having at least one lead on a facing surface thereof, said at least one lead of said second substrate having at least one conductive pad disposed thereon, said at least one conductive pad of said second substrate having an upper surface, having a thickness and extending above said facing surface of said second substrate, said thickness of said at least one conductive pad of said second substrate being at least a thickness of a remaining portion of said at least one via having said at least one conductive pad of said first substrate extending thereinto, one of said first substrate and said second substrate being attached to another one of said first substrate and said second substrate by a glob top covering said one of said first substrate and said second substrate and adhering to at least a portion of said facing surface of said another one of said first substrate and said second substrate, said one of said first substrate and said second substrate having said upper surface of said at least one conductive pad on said at least one lead thereof substantially forming movable, electrical contact without mechanical attachment with said upper surface of said at least one conductive pad on said at least one lead of said another one of said first substrate and said second substrate, said movable, electrical contact provided

when said one of said first substrate and said second substrate is permanently attached to said another one of said first substrate and said second substrate by said glob top.

8. (Amended) A semiconductor assembly comprising:

a first semiconductor device having at least one lead on a first side thereof, said at least one lead having at least one conductive pad disposed thereon having a substantially flat surface thereon, having a thickness and extending above said first side of said first semiconductor device said thickness of said at least one conductive pad, said first semiconductor device having a passivation layer disposed on said first side thereof having a thickness greater than said thickness of said at least one conductive pad, said passivation layer having at least one via therein, said at least one conductive pad extending into and through only a portion of said at least one via; and

a second semiconductor device having at least one lead on a first side thereof, said at least one lead of said second semiconductor device having at least one conductive pad disposed thereon, said at least one conductive pad of said second semiconductor device having a substantially flat surface thereon, having a thickness and extending above said first side of said second semiconductor device, said thickness of said at least one conductive pad of said second semiconductor device being at least a thickness of a remaining portion of said at least one via having said at least one conductive pad of said first semiconductor device extending thereinto, said second semiconductor device being juxtaposed to said first semiconductor device with said substantially flat surface of said at least one conductive pad on said at least one lead of said first semiconductor device substantially movably electrically contacting without mechanical attachment said substantially flat surface of said at least one conductive pad on said at least one lead of said second semiconductor device substantially making electrical contact therewith, said first semiconductor device being attached to said second semiconductor device by an encapsulation material substantially surrounding said first semiconductor device and a portion of said second semiconductor device.

9. (Amended) The semiconductor assembly of claim 8, wherein at least one of said first side of said first semiconductor device and said first side of said second semiconductor device includes at least one groove thereon.

10. (Amended) The semiconductor assembly of claim 9, wherein at least one of said first semiconductor device and said second semiconductor device comprises a flip chip.

11. (Amended) The semiconductor assembly of claim 9, wherein at least one of said first semiconductor device and said second semiconductor device comprises a silicon wafer.

12. (Amended) An assembly comprising:

a first semiconductor device having a plurality of leads on a first side thereof, each lead of said plurality of leads having a conductive pad disposed thereon in a substantially horizontal plane, each conductive pad having a substantially flat surface disposed in said substantially horizontal plane thereon, having a thickness and extending above said first side of said first semiconductor device said thickness of said each conductive pad, said first semiconductor device having a passivation layer disposed on said first side thereof having a thickness greater than said thickness of said each conductive pad, said passivation layer having at least one via therein for said each conductive pad, said each conductive pad extending into and through only a portion of said at least one via, and said first semiconductor device having a layer of adhesive covering at least a portion of said passivation layer on said first side, said layer of adhesive having a thickness; and

a second semiconductor device having a plurality of leads on a first side thereof, each lead of said plurality of leads of said second semiconductor device having a conductive pad disposed thereon in a substantially horizontal plane, each conductive pad of said second semiconductor device having a substantially flat surface disposed in said substantially horizontal plane thereon, having a thickness and extending above said first side of said second semiconductor device, said thickness of said each conductive pad of said second

semiconductor device being at least a combined thickness of said layer of adhesive covering at least a portion of said passivation layer on said first side of said first semiconductor device and a remaining portion of said each at least one via having said conductive pad of said first semiconductor device extending thereinto, said second semiconductor device being juxtaposed to said first semiconductor device by said layer of adhesive, said first semiconductor device having at least one conductive pad disposed on at least one lead of said plurality of leads of said first semiconductor device forming movable electrical contact without mechanical attachment with at least one conductive pad on at least one lead of said plurality of leads of said second semiconductor device, said movable, electrical contact provided when said second semiconductor device is permanently attached to said first semiconductor device by said layer of adhesive.

A1 cont

13. (Amended) The assembly of claim 12, wherein at least one of said first side of said first semiconductor device and said first side of said second semiconductor device includes at least one groove thereon.

14. (Amended) The assembly of claim 12, wherein at least one of said first semiconductor device and said second semiconductor device comprises a flip chip.

15. (Amended) The assembly of claim 12, wherein at least one of said first semiconductor device and said second semiconductor device comprises a silicon wafer.

16. (Amended) An assembly comprising:

a silicon substrate having a plurality of leads on a first side thereof, each lead of said plurality of leads having a conductive pad disposed thereon in a substantially horizontal plane, each conductive pad having a substantially flat surface disposed in said substantially horizontal plane thereon, having a thickness and extending above said first side of said silicon substrate said thickness of said each conductive pad, said silicon substrate having a

passivation layer disposed on said first side thereof having a thickness greater than said thickness of said each conductive pad, said passivation layer having at least one via therein for said each said conductive pad, said each conductive pad extending into and through only a portion of said at least one via, and said silicon substrate having a layer of adhesive covering at least a portion of said passivation layer on said first side, said layer of adhesive having a thickness; and

at least one semiconductor device having a plurality of leads on a first side thereof, each lead of said plurality of leads of said at least one semiconductor device having a conductive pad disposed thereon in a substantially horizontal plane, each conductive pad of said at least one semiconductor device having a substantially flat surface disposed in said substantially horizontal plane thereon, having a thickness and extending above said first side of said at least one semiconductor device, said thickness of said each conductive pad of said at least one semiconductor device being at least a combined thickness of said layer of adhesive covering at least a portion of said passivation layer on said first side of said silicon substrate and a remaining portion of said each at least one via having said each conductive pad of said silicon substrate extending thereinto, said at least one semiconductor device being juxtaposed to said silicon substrate by said layer of adhesive, said silicon substrate having said conductive pad on at least one lead of said plurality of leads on said silicon substrate forming movable electrical contact without mechanical attachment with said conductive pad on at least one lead of said plurality of leads of said at least one semiconductor device, said movable, electrical contact provided when said at least one semiconductor device is permanently attached to said silicon substrate by said layer of adhesive.

17. (Amended) The assembly of claim 16, wherein at least one of said first side of said silicon substrate and said first side of said at least one semiconductor device includes at least one groove thereon.

18. (Amended) The assembly of claim 16, wherein at least one of said silicon substrate and said at least one semiconductor device comprises a flip chip.

19. (Amended) The assembly of claim 16, wherein at least one of said silicon substrate and said at least one semiconductor device comprises a silicon wafer.

20. (Amended) An assembly comprising:

a substrate having at least one lead on a facing surface thereof, said at least one lead having at least one conductive pad disposed thereon, said at least one conductive pad having an upper surface, having a thickness and extending above said facing surface of said substrate said thickness of said at least one conductive pad, said substrate having a passivation layer disposed on said facing surface thereof having a thickness greater than said thickness of said at least one conductive pad, said passivation layer having at least one via therein, said at least one conductive pad extending into and through only a portion of said at least one via; and

at least one semiconductor device having at least one lead on an active surface thereof having at least one bond pad disposed thereon, said at least one bond pad of said at least one semiconductor device having an upper surface, having a thickness and extending above said active surface of said at least one semiconductor device, said at least one semiconductor device having a layer of adhesive having a thickness on at least a portion of said active surface thereof, said at least one semiconductor device being attached to said substrate by said layer of adhesive, said upper surface of said at least one conductive pad on said at least one lead of said substrate substantially forming movable, electrical contact without mechanical attachment with said upper surface of said at least one bond pad on said at least one lead of said at least one semiconductor device, said movable electrical contact provided when said at least one semiconductor device is permanently attached to said substrate by said layer of adhesive.

REMARKS

No new matter has been added. The Applicant requests entry of the foregoing amendment prior to examination of the application on the merits.

Respectfully submitted,

James R. Duzan
Registration No. 28,393
Attorney for Applicant
TRASKBRITT
P. O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: (801) 532-1922

Date: February 12, 2002

JRD/df/dp